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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

First Named
Inventor : Ricardo SoonLian Lim et al.

Appln. No. : 10/603,015

Filed : June 24, 2003

For : MULTI-TIERED RETRY SCHEME FOR
READING COPIES OF INFORMATIN
FROM A STORAGE MEDIUM

Docket No.: S104.12-0041/STL 11309.00

Appeal No. ---

Group Art Unit: 2116

Examiner: Nitin C. Patel

BRIEF FOR APPELLANT

Mail Stop Appeal Brief-Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

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2007.

A. Rego
PATENT ATTORNEY

Sir:

This is an appeal from an Office Action dated December 1, 2006, in which claims 1 to 21 were finally rejected.

REAL PARTY IN INTEREST

Seagate Technology LLC, a corporation organized under the laws of the state of Delaware, and having offices at 920 Disc Drive, Scotts Valley, CA 95066, has acquired the entire right, title and interest in and to the invention, the application, and any and all patents to be obtained therefor, as set forth in the Assignment filed with the patent application and recorded on Reel 014238, frame 0903.

RELATED APPEALS AND INTERFERENCES

There are no known related appeals or interferences which will directly affect or be directly affected by or have a bearing on the Board's decision in this appeal.

STATUS OF THE CLAIMS

I. Total number of claims in the application.

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| | Claims in the application are: | 1-21 |
| II. | Status of all the claims. | |
| | A. Claims cancelled: | --- |
| | B. Claims withdrawn but not cancelled: | --- |
| | C. Claims pending: | 1-21 |
| | D. Claims allowed: | --- |
| | E. Claims rejected: | 1-21 |
| | F. Claims Objected to: | 21 |
| III. | Claims on appeal | |
| | The claims on appeal are: | 1-21 |

STATUS OF AMENDMENTS

An Amendment After Final was filed subsequent to the final rejection. In the Amendment After Final, the only amendment made was to cancel an extraneous period at the end of the first element of claim 21. This amendment was made because, in the Final Office Action, the Examiner stated that, in a previous Amendment, the cancellation of the period was not clear.

However, the Examiner refused to enter this simple, grammatical amendment without providing any basis for the refusal.

SUMMARY OF CLAIMED SUBJECT MATTER

Independent claim 1 is directed to a process for reading information from a storage medium on which multiple copies of the information are stored. The process includes establishing minimal and maximal numbers of read retry attempts (200 of FIG. 2 and page 6, lines 16-19). Iterative attempts are made to read successive copies of the information until either the information is successfully read or the information is not successfully read from any copy of the information after the minimal number of attempts (202, 204 and 206 of FIG. 2 and page 6, line 19 through page 7, line 8). If the information is not successfully read in the previous step, iterative attempts are made to read successive copies of the information until either the information is successfully read or the information is not successfully read from any copy of the information after the maximal number of attempts (208, 210 and 212 of FIG. 2 and page 7, lines 9-17).

Independent claim 7, which is similar to independent claim 1, is directed to a computer useable medium having a computer readable program embodied therein (page 8, lines 7-10) for addressing data to attempt to read information from a storage medium (106 of FIG. 1 and page 4 lines 24-26) on which multiple copies of the information are stored. Independent claim 7 includes first computer readable program code for causing the computer to establish minimal and maximal numbers of read retry attempts (200 of FIG. 2 and page 6, lines 16-19). Also included is second computer readable program code for causing the computer to iteratively attempt to read successive copies of the information until either the information is successfully read or the information is not successfully read from any copy of the information after the minimal number of attempts (202, 204 and 206 of FIG. 2 and page 6, line 19 through page 7, line 8); and third computer readable program code for causing the computer to respond to an unsuccessful reading of the information by the second program code to cause the computer to iteratively attempt to read successive copies of the information until either the information is successfully read or the information is not successfully read from any copy of the information after the maximal number of attempts (208, 210 and 212 of FIG. 2 and page 7, lines 9-17).

Independent claim 13, which is similar to independent claims 1 and 7, is directed to a disc drive storage device that includes firmware (128 of FIG. 1 and page 8, line 11) that comprises first program code for causing the processor to establish minimal and maximal numbers of read retry attempts (200 of FIG. 2 and page 6, lines 16-19). Also included in the firmware is second program code for causing the processor to iteratively attempt to read successive copies of the information until either the information is successfully read or the information is not successfully read from any copy of the information after the minimal number of attempts (202, 204 and 206 of FIG. 2 and page 6, line 19 through page 7, line 8); and third program code for causing the processor to respond to an unsuccessful reading of the information by the second program code to cause the processor to iteratively attempt to read successive copies of the information until either the information is successfully read or the information is not successfully read from any copy of the information after the maximal number of attempts (208, 210 and 212 of FIG. 2 and page 7, lines 9-17).

Independent claim 21 is directed to a method that includes establishing minimal and maximal numbers that define two levels of retry attempts to read information on a storage medium (200 of FIG. 2 and page 6, lines 16-19); and storing the established minimal and maximal numbers in a device that includes the storage medium (page 8, lines 10 – 13).

GROUND OF REJECTION TO BE REVIEWED ON APPEAL

Claims 1-20 were rejected under 35 U.S.C. §101 as being directed to non-statutory subject matter because they were said to merely manipulate an abstract idea without a claim limitation to a practical application.

Claim 21 was rejected under 35 U.S.C. §102(b) as being anticipated by Semba, U.S. Patent No. 5,504,726 B1.

ARGUMENT

I. CLAIM OBJECTIONS

In section 4 of the Final Office Action, claim 21 was objected to because of minor informalities regarding punctuation. As noted above, Applicants attempted to amend the punctuation of claim 21, but the Examiner refused to enter the amendment.

Applicants respectfully request that the decision to refuse entry of the Amendment After Final dated February 1, 2007, be reversed since there exists no basis to refuse entry.

II. CLAIM REJECTIONS UNDER 35 U.S.C. §101

In section 6 of the Office Action, claims 1-20 were rejected under 35 U.S.C. §101 as being directed to non-statutory subject matter because they were said to merely manipulate an abstract idea without a claim limitation to a practical application. Specifically, the Office Action suggests that there is no concrete, useful and tangible result at the end of “the maximal number of read retry attempts” in independent claims 1, 7 and 13.

The claimed subject matter is directed to read attempts, which are a statutory tangible result for a process, and data successfully read and maximum read retry attempts are boundary conditions for the process. Further operations are beyond the scope of the claimed subject matter. Thus the rejection should be reversed.

As noted above, independent claim 1, which is directed to a process for reading

information from a storage medium on which multiple copies of the information are stored, includes:

- a) establishing minimal and maximal numbers of read retry attempts;
- b) iteratively attempting reading successive copies of the information until either the information is successfully read or the information is not successfully read from any copy of the information after the minimal number of attempts; and
- c) if the information is not successfully read in step (b), iteratively attempting reading successive copies of the information until either the information is successfully read or the information is not successfully read from any copy of the information after the maximal number of attempts.

As noted on page 2 of the specification, before the present embodiments, retry attempts were always carried out a predetermined number of times (based on a single retry attempt threshold) for a particular copy of information before moving on to a next copy of the information. As indicated at the top of page 6 of the specification, by establishing minimal and maximal numbers of retry attempts, the present embodiments do not have to exhaust all retry attempts based on a single threshold, but can move on to the next copy of information after the minimal number of retry attempts is reached. Only if retry attempts to read all copies of information based on the minimal number of retry attempts fail, the retry process continues based on the maximal number of retry attempts. Events that may occur after “the maximal number of read retry attempts” is reached are irrelevant to the present embodiments.

Accordingly, the process being claimed in claim 1 is directed to iterative attempts at reading and not what happens after the iterative attempts. Such later events and results are irrelevant to claim 1 and to claims 7 and 13, which are similar to claim 1. Applicants respectfully point out that read attempts themselves are a tangible result adequate to meet the requirements of 35 U.S.C. §101 (in the context of a disc drive recited in claim 13 such read attempts could correspond to a series of commands and resulting actuator movements, signal processing operations, etc., for example). Moreover, it would be well-understood by one of ordinary skill reading the claim that the cumulative results of the routine are either the data is read or the end of the retry scheme is reached

(and further operations such as transfer of control to whatever routine called the retry routine). Such post routine operations are beyond the bounds of the claimed subject matter and unnecessary to meet the requirements of 35 U.S.C. §101.

The conditional statement in the last paragraph of claim 1 expressly provides a positive limitation that includes “iteratively attempting reading successive copies of the information until either the information is successfully read or the information is not successfully read from any copy of the information after the maximal number of attempts.”

Thus, the maximal number provides a tangible bound on the number of iterative read attempts performed on the storage medium during step (c) of claim 1. Step (c) therefore provides a tangible result (iteratively attempting to read) on a physical device (storage medium) and provides a tangible bound to the number of iterations. This satisfies the §101 requirement of a concrete, useful and tangible result for a claim and, as noted above, any subsequent events and results are irrelevant to claim 1.

Claims 7 and 13 produce useful, concrete and tangible results since they also include elements similar to step (c) of claim 1. Specifically, as noted above, claim 7 includes third computer readable program code for causing the computer to respond to an unsuccessful reading of the information by the second program code to cause the computer to iteratively attempt to read successive copies of the information until either the information is successfully read or the information is not successfully read from any copy of the information after the maximal number of attempts. Similarly, as noted above, claim 13 includes third program code for causing the processor to respond to an unsuccessful reading of the information by the second program code to cause the processor to iteratively attempt to read successive copies of the information until either the information is successfully read or the information is not successfully read from any copy of the information after the maximal number of attempts.

As such, claims 1, 7 and 13 all define statutory processes and do not merely manipulate an abstract idea but instead produce useful, concrete and tangible results. Thus, the rejection of claims 1, 7 and 13 under 35 U.S.C. §101 should be reversed.

III. CLAIM REJECTIONS UNDER 35 U.S.C. §102

In section 11 of the Office Action, claim 21 was rejected under 35 U.S.C. §102(b) as being anticipated by Semba, U.S. Patent No. 5,504,726 B1.

As noted above, claim 21 includes “establishing minimal and maximal numbers that define two levels of retry attempts to read information on a storage medium.”

The Semba reference deals in general with the calibration of tracking error signals and focus error signals when an optical disk drive is in normal operation mode. The cited FIG. 3 and language (col. 5, lines 1-27; col. 6, lines 5-13, 35-39) of Semba describe the utilization of minimum and maximum values of a tracking error signal in a specific method embodiment for calibrating tracking error signals. The Office Action suggests that the minimum and maximum values of the tracking error signal are the same as the minimal and maximal numbers in the above-noted element of claim 21. Appellants respectfully assert that minimum and maximum values of a signal (such as the tracking error signal in Semba) have nothing to do with minimal and maximal numbers that define two levels of retry attempts to read information on a storage medium. Thus, Semba does not anticipate claim 21.

IV. CONCLUSION

Appellants respectfully submit that the dependent claims are also allowable at least by virtue of their dependency, either directly or indirectly, from the allowable independent claims. Thus, Appellants respectfully request that the Board reverse the Examiner and find all pending claims allowable.

Respectfully submitted,

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Appendix A

1. A process for reading information from a storage medium on which multiple copies of the information are stored, the process comprising:
 - a) establishing minimal and maximal numbers of read retry attempts;
 - b) iteratively attempting reading successive copies of the information until either the information is successfully read or the information is not successfully read from any copy of the information after the minimal number of attempts;
and
 - c) if the information is not successfully read in step (b), iteratively attempting reading successive copies of the information until either the information is successfully read or the information is not successfully read from any copy of the information after the maximal number of attempts.
2. The process of claim 1, further including:
 - d) if the information is successfully read or if the information is not successfully read in step (c), ending the process.
3. The process of claim 1, wherein the attempt to read the information of step (b) is performed on each copy of the information successively up to the minimal number of attempts.
4. The process of claim 3, wherein the attempt to read the information of step (c) is performed on each copy of the information successively up to the maximal number of attempts.
5. The process of claim 4, further including:
 - d) if the information is successfully read or if the information is not successfully read in step (c), ending the process.
6. The process of claim 3, further including:

- d) if the information is successfully read or if the information is not successfully read in step (c), ending the process.

7. A computer useable medium having a computer readable program embodied therein for addressing data to attempt to read information from a storage medium on which multiple copies of the information are stored, the computer readable program comprising:

- first computer readable program code for causing the computer to establish minimal and maximal numbers of read retry attempts;

- second computer readable program code for causing the computer to iteratively attempt to read successive copies of the information until either the information is successfully read or the information is not successfully read from any copy of the information after the minimal number of attempts; and

- third computer readable program code for causing the computer to respond to an unsuccessful reading of the information by the second program code to cause the computer to iteratively attempt to read successive copies of the information until either the information is successfully read or the information is not successfully read from any copy of the information after the maximal number of attempts.

8. The computer useable medium of claim 7, further including:

- fourth computer readable program code for causing the computer respond to successful reading of the information to cause the computer to end reading attempts, and

- fifth computer readable program code for causing the computer to respond to unsuccessful reading of the information by the computer in response to execution of the third program code to cause the computer to end reading attempts.

9. The computer useable medium of claim 7, wherein the attempt to read the information performed by the computer by the second program code is performed on each copy of the information successively up to the minimal number of attempts.
10. The computer useable medium of claim 9, wherein the attempt to read the information performed by the computer by the third program code is performed on each copy of the information successively up to the maximal number of attempts.
11. The computer useable medium of claim 10, further including:
 - fourth computer readable program code for causing the computer respond to successful reading of the information to cause the computer to end reading attempts,
 - and
 - fifth computer readable program code for causing the computer to respond to unsuccessful reading of the information by the computer in response to execution of the third program code to cause the computer to end reading attempts.
12. The computer useable medium of claim 9, further including:
 - fourth computer readable program code for causing the computer respond to successful reading of the information to cause the computer to end reading attempts,
 - and
 - fifth computer readable program code for causing the computer to respond to unsuccessful reading of the information by the computer in response to execution of the third program code to cause the computer to end reading attempts.
13. A disc drive storage device comprising:
 - a storage medium for storing data including multiple copies of an information;

a processor; and

firmware defining a computer readable program that causes the processor to attempt to read the information from the storage medium, the firmware comprising:

first program code for causing the processor to establish minimal and maximal numbers of read retry attempts;

second program code for causing the processor to iteratively attempt to read successive copies of the information until either the information is successfully read or the information is not successfully read from any copy of the information after the minimal number of attempts; and

third program code for causing the processor to respond to an unsuccessful reading of the information by the second program code to cause the processor to iteratively attempt to read successive copies of the information until either the information is successfully read or the information is not successfully read from any copy of the information after the maximal number of attempts.

14. The disc drive storage device of claim 13, wherein the attempt to read the information performed by the processor by the second program code is performed on each copy of the information successively up to the minimal number of attempts.

15. The disc drive storage device of claim 14, wherein the attempt to read the information performed by the processor by the third program code is performed on each copy of the information successively up to the maximal number of attempts.

16. The disc drive storage device of claim 13, wherein the attempt to read the information performed by the processor by the third program code is performed on each copy of the information successively up to the maximal number of attempts.

17. The disc drive storage device of claim 13, wherein the storage medium includes a plurality of sectors and the multiple copies of the information is stored in predetermined sectors.
18. The disc drive storage device of claim 13, wherein the firmware further includes:
fourth program code for causing the processor respond to successful reading of the information to cause the processor to end reading attempts, and
fifth computer readable program code for causing the processor to respond to unsuccessful reading of the information by the processor in response to execution of the third program code to cause the processor to end reading attempts.
19. The disc drive storage device of claim 18, wherein the attempt to read the information performed by the processor by the second program code is performed on each copy of the information successively up to the minimal number of attempts and the attempt to read the information performed by the processor by the third program code is performed on each copy of the information successively up to the maximal number of attempts.
20. The disc drive storage device of claim 18, wherein the storage medium includes a plurality of sectors and the multiple copies of the information is stored in predetermined sectors.
21. A method comprising:
establishing minimal and maximal numbers that define two levels of retry attempts to read information on a storage medium.; and
storing the established minimal and maximal numbers in a device that includes the storage medium.

Evidence Appendix

None.

Related Proceedings Appendix

There are no known related appeals or interferences which will directly affect or be directly affected by or have a bearing on the Board's decision in this appeal.